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PROVISIONAL SPECIFICATION

Improvements in Electric Torches

I, JOHN SAUNDERS WEBSTER, a British Subject, of 287, Beach Road, Mentone, in the State of Victoria, Commonwealth of Australia, do hereby declare the nature of this invention to be as follows:—

This invention relates to electric torches and refers more particularly to such torches of the type which include a cylindrical body or barrel having at one end a rotatable head piece within which the torch lens and the electric lamp or bulb is located, the opposite end of the barrel being fitted with a detachable tail piece or closure which may be removed to permit of the insertion and withdrawal of the usual dry cell or cells.

Such torches are usually provided with a switch comprising a press button and a sliding catch whereby the press button may be held in its depressed position to keep the torch alight when so desired. Focusing of the light is usually effected by rotary movement of the head piece in opposite directions, the head piece being permanently attached to the barrel and provided with a detachable lens holder or cap which is usually screwed to the front end of the head piece and permits of the insertion and replacement of the lamp bulb.

Torches of the foregoing type as hitherto constructed possess various objections such as the excessive number of parts involving various screwed connections by which the parts, such as the tail piece and the lens holder are attached to the barrel and to the head piece respectively. Furthermore the abovementioned switch in such known constructions is liable to easy derangement so as to render the torch inoperative.

The object of the present invention is to provide improvements in electric torches of the general type referred to whereby a more simple, inexpensive and efficient construction is provided embodying relatively few parts which are not liable to disorder.

One of the principal features of the invention resides in the arrangement whereby the usual switch is dispensed with and the switching operation is effected by rotary movement of the head piece in re-

lation to the torch barrel whilst the focusing operation is effected by longitudinal movement of the head piece in relation to the barrel. This longitudinal movement may be performed in an extremely simple and convenient manner by pressing the head piece forwardly under pressure of the operator's thumb against the action of a spring which automatically returns the head piece to its normal longitudinal position on the barrel when the thumb pressure is released.

Other features of the invention reside in the improved construction and arrangement of the lamp bulb holder, the lens holder or retaining ring, the tail piece, the spare bulb holder therein and other parts, all of which may be detachably connected together in accordance with the invention, without the use of screw threads.

The foregoing and other features of the invention will, however, be better understood from the following description of a suitable practical embodiment of the invention.

The invention includes a cylindrical body or barrel which is open at its lower or rear end and is closed at its upper or front end by means of a bulb holder comprising a metal disc having a central hole from which a tubular socket extends forwardly to receive the lamp bulb in the usual manner. Electrical contact between the bulb stem and the dry cell or cells is effected through said central hole which receives the usual contact nipple on the dry cell adjacent the lamp.

The said disc of the bulb holder may be accommodated between upper and lower discs of non-insulating material such as fibreboard or the like, the three discs being secured within a slightly enlarged or flanged upper end portion of the torch barrel. This flange or enlargement is provided with tongues which are bent over upon the upper insulating disc, the flanged portion of the barrel being also provided with a contact in the form of a lug which is adapted to engage a segmental contact plate within the head piece as hereinafter described.

The bulb holder is also provided with a contact in the form of a tongue which up-

stands from the aforesaid metal disc and is also adapted to engage said segmental contact plate on the head piece to thereby complete the circuit through the lamp when the segmental contact plate is brought into engagement with the two adjacent contacts on the bulb holder and the upper end of the barrel.

The head piece consists of a sleeve of electrically non-conductive material which may be of somewhat tapered or inverted conical form on its exterior. The tubular passage through this sleeve is adapted to rotatably accommodate the front end portion of the torch barrel and the bulb holder thereon so that by relative rotary movement between the barrel and the head piece the aforesaid contacts on the front end of the barrel and the bulb holder are brought into engagement with the segmental contact plate which is secured to the inside of the head piece. These three contact members thus constitute the switch elements of the torch.

Encircling the front end portion of the barrel is a compression spring which is accommodated within the tubular passage through the head piece, between an annular shoulder near the lower or rear end thereof and the aforesaid flange or enlargement on the front end of the barrel. Thus, when the head piece is pressed forwardly in relation to the barrel by pressure of the thumb against the rear portion of the head piece this spring is compressed and when the thumb pressure is released, the head piece is automatically returned by the spring to its normal position thereby effecting the focusing operation in a simple and convenient manner.

A bulbous or other projection may be provided on the exterior of the head piece near its rear end to engage the thumb of the operator during the longitudinal movement of the head piece which effects the focusing operation when the contacts on the front end of the barrel are engaged with the segmental contact plate within the head piece.

The usual reflector is arranged within the head piece behind the lamp bulb and the lens is accommodated in the front portions of the head piece by means of a lens holder or retaining ring. This ring is provided with a pair of oppositely disposed locking lugs which are adapted to engage within substantially L shaped slots or recesses in the upper end of the head piece. The retaining ring is also provided with projecting thumb and finger pieces by which it may be conveniently turned for a slight distance when the locking lugs are engaged within said slots or recesses to thereby attach and detach the retaining ring or lens holder, on the head

piece, when it is desired, for instance, to gain access to the lamp bulb.

The tail piece in accordance with the invention preferably consists of a plug of electrically non-conductive material having an external surface of downwardly converging or inverted conical form above which is a cylindrical portion adapted for detachable engagement with the lower or rear end of the torch barrel. This cylindrical portion of the tail piece is hollow and is provided on its exterior with two oppositely disposed segmental recesses extending longitudinally of the tail piece and communicating with a pair of segmental grooves which are located out of longitudinal alignment with said recesses. The lower or rear end of the torch barrel is provided with corresponding oppositely disposed segmental flanges which are turned inwardly from the barrel and are adapted to be entered through said recesses into the associated segmental grooves by partial rotation of the tail piece in relation to the barrel whereby these two parts are detachably connected together in a simple and effective manner and without the aid of screw threads.

Removably accommodated within the tail piece is a contact member which may also serve as a spare bulb holder. This member may consist of a metal plate or disc having oppositely disposed segmental lugs adapted to engage corresponding segmental recesses inside the tail piece. The disc is provided with a contact in the form of an outstanding tongue which is adapted to engage the inner surface of the torch barrel and thus complete the circuit between the metal barrel and the bottom or rear end of the dry cell through the medium of a compression spring which is secured to the disc. When the tail piece is in place this spring presses forwardly so that the usual contact nipple on the front end of the cell within the head piece is kept in engagement with the lamp bulb.

The said disc of the contact member within the tail piece may also be provided with a spring clip comprising a pair of spring lugs which may be cut or stamped from the disc so as to accommodate the spare lamp bulb behind the disc and within the hollow portion of the tail piece.

In use, the torch is switched on and off by turning the head piece in relation to the barrel in such a manner that the segmental contact plate within the head piece is engaged by the two contacts on the front end of the barrel and the bulb holder disc as aforesaid. The focusing operation may be then readily effected by merely pressing the head piece forwardly against the influence of the compression

spring therein which serves to return the head piece longitudinally of the barrel to its normal position.

The invention provides a simple and inexpensive combination and arrangement of parts which function effectively, are not liable to disorder and may be readily assembled and taken apart.

It is to be understood that various alter-

ations, modifications and/or additions may be embodied in the foregoing construction without departing from the spirit and scope of the invention.

Dated this 17th day of August, 1940.

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COMPLETE SPECIFICATION

Improvements in Electric Torches

1, JOHN SAUNDERS WEBSTER, a British Subject, of 237, Beach Road, Mentone, in the State of Victoria, Commonwealth of Australia, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric torches and refers more particularly to such torches of the type which include a cylindrical body or barrel having at one end a rotatable head piece within which the torch lens and the electric lamp or bulb is located, the opposite end of the barrel being fitted with a detachable tail piece or closure which may be removed to permit of the insertion and withdrawal of the usual dry cell or cells.

Such torches are usually provided with a switch comprising a press button and a sliding catch whereby the press button may be held in its depressed position to keep the torch alight when so desired. Focusing of the light is usually effected by rotary movement of the head piece in opposite directions, the head piece being permanently attached to the barrel and provided with a detachable lens holder or cap which is usually screwed to the front end of the head piece and permits of the insertion and replacement of the lamp bulb.

Torches of the foregoing type as hitherto constructed possess various objections such as the excessive number of parts involving various screwed connections by which the parts, such as the tail piece and the lens holder are attached to the barrel and to the head piece respectively. Furthermore the abovementioned switch in such known constructions is liable to easy derangement so as to render the torch inoperative.

The object of the present invention is to provide improvements in electric torches of the general type referred to whereby a more simple, inexpensive and efficient construction is provided embodying re-

latively few parts which are not liable to disorder.

The invention resides in the arrangement whereby the usual switch is dispensed with and the switching operation is effected by rotary movement of the head piece in relation to the torch barrel whilst the focusing operation is effected by longitudinal movement of the head piece in relation to the barrel. This longitudinal movement may be performed in an extremely simple and convenient manner by pressing the head piece forwardly under pressure of the operator's thumb against the action of a spring which automatically returns the head piece to its normal longitudinal position on the barrel when the thumb pressure is released.

The foregoing and other features of the invention will, however, be better understood from the following description of a suitable practical embodiment of the invention,

But in order that this invention may be better understood reference will now be made to the accompanying sheets of drawings which are to be taken as part of this specification and read herewith:—

Figure 1 is a part sectional side elevation of an electric torch in accordance with the invention, parts being broken away for convenience of illustration.

Figure 2 is a cross sectional plan on the line A—A of Figure 1.

Figure 3 is a cross sectional plan on the line B—B of Figure 1.

Figure 4 is a fragmentary section of the upper portion of the torch barrel showing the metal bulb holder for the electric lamp with its contact member and adjacent insulating discs.

Figure 5 is a perspective view showing a modified construction of the bulb holder and its contact member, the latter being shown in full lines and the bulb holder in broken lines.

Figure 6 is a fragmentary side view, partly in section showing on a somewhat enlarged scale the insulating socket which

is secured within the lower end of the torch barrel and is adapted for detachable connection to the hollow tail piece, as seen in Figure 1.

5 Figure 7 is a plan showing a modified construction of the tail piece and a contact plate thereon.

Figure 8 is a part sectional side elevation of the construction seen in Figure 7, 10 the lower portion of the torch barrel being indicated in broken lines.

Figure 9 is a sectional perspective view of the head piece which is adapted to rotate and slide longitudinally upon the 15 upper or front end of the torch barrel as seen in Figure 1, a contact plate within said head piece being also shown.

Figure 10 is a plan of a modified construction of the head piece.

20 Figure 11 is a cross section on the line C-C of Figure 10.

Figure 12 is a fragmentary cross section of the modified head piece seen in Figures 10 and 11, taken in a plane at right angles 25 to that of Figure 11.

Figure 13 is a diagram illustrating the electrical circuit of the improved torch.

The invention includes a cylindrical body or barrel 2 which is open at its lower 30 or rear end and is closed at its upper or front end by means of a bulb holder comprising a metal disc 3 having a centrally disposed tubular socket 6 which extends forwardly to receive the lamp bulb 7 in 35 the usual manner. Electrical contact between the bulb stem and the adjacent dry cell or battery is effected in the usual way through the contact nipple 4 on the lamp which engages the adjacent battery 40 contact.

The said disc 3 of the bulb holder may be accommodated between upper and lower discs 8, 9, of insulating material such as fibreboard or the like, the three discs being 45 secured within a slightly enlarged or flanged upper end portion 11 of the torch barrel 2 by means of intumed tongues 12 which are cut from the upper end of the barrel 2 and bent over upon the upper insulating disc 8, as seen in Figure 2. 50

The metal disc 3 of the bulb holder is also provided with a contact in the form of a lug 13 which is adapted to engage a segmental contact plate 14 within the 55 head piece as hereinafter described. The contact lug 13 may be formed integral with the bulb holder disc 3 as seen in Figure 4, or, as seen in Figure 5 the contact 13 may be separately formed of 60 spring metal and secured as by soldering to the bulb holder disc 3. The lug 13 projects upwardly or forwardly through an opening 8a in the upper insulating disc 8.

The head piece 16 consists of a sleeve of 65 electrically non-conductive material

which may be of somewhat tapered or inverted conical form on its exterior, as shown. The tubular passage through this sleeve is adapted to rotatably accommodate the front end portion of the torch 70 barrel 2 and the bulb holder thereon so that by relative rotary movement between the barrel and the head piece the contact 13 on the bulb holder is brought into engagement with the segmental contact plate 14 75 which is secured to the inside of the head piece. These two contact members thus constitute the switch elements of the torch.

The contact plate 14 is accommodated in 80 a corresponding groove or recess 17 in the inner surface of the head piece or sleeve 16 and the side edges of this recess and the plate 14 are preferably of dovetail shape, as shown, to prevent the contact 85 plate falling inwardly when the head piece is being fitted to the barrel 2.

Encircling the front end portion of the barrel is a compression spring 18 which is 90 accommodated within the tubular passage through the head piece 16 between an annular shoulder 19 near the lower or rear end thereof and the aforesaid flange or enlargement 11 on the front end of the barrel. Thus, when the head piece is pressed 95 forwardly in relation to the barrel by pressure of the thumb against the rear portion of the head piece this spring is compressed and when the thumb pressure is released, the head piece is automatically returned 100 by the spring to its normal position thereby effecting the focusing operation in a simple and convenient manner.

The contact plate 14 is preferably provided at its lower end with a tongue 14a 105 which is turned inwardly and rests upon the shoulder 19 of the head piece, as seen in Figure 9.

A bulbous or other projection 21 may be provided on the exterior of the head 110 piece near its rear end to engage the thumb of the operator during the longitudinal movement of the head piece which effects the focusing operation when the contact 13 on the front end of the barrel 115 is engaged with the segmental contact plate 14 within the head piece. The projection 21 may register with an indicator 22 on the barrel 2 when the light is thus switched on. 120

Stops 20 may be formed on the flanged upper end portion 11 of the barrel 2 by turning certain of the tongues thereon outwardly as seen in Figures 1, 2 and 4. These stops may move in a segmental 125 groove or recess 20a seen in Figures 1 and 2 so that by engaging the ends of this groove the stops 20 limit the turning movement of the head piece 16 when the torch is being switched on and off. 130

Instead of forming the grooves or recesses 17 and 20a in the inner surface of the tubular passage through the head piece, as seen in Figures 1 and 2, vertical ribs 23 and 23a (see Figures 10 to 12) may be formed inside the head piece, the inner surface of which may be slightly tapered, as seen in Figures 11 and 12. The segmental contact plate 14 may be fitted between the ribs 23 as indicated in broken lines in Figure 10, whilst the stops 20 are accommodated between the two ribs 23a so as to limit the turning movement of the head piece in relation to the barrel when switching the torch on and off as aforesaid.

The usual reflector 24 is arranged within the head piece behind the lamp bulb 7 and the lens 25 is accommodated in the front portion of the head piece by means of a lens holder or retaining ring 26 which is detachably fitted, preferably by means of the screw thread 27, to the front end of the head piece, so as to provide ready access to the lamp bulb and the lens.

The tail piece in accordance with the invention may comprise, as seen in Figures 1, 3 and 6, a hollow plug or cap 29 of electrically non-conductive material, such for instance as "Bakelite" (Registered Trade Mark), having a wall of downwardly converging or inverted conical form. This member may be detachably connected, as by the screw thread 31, to a cylindrical member or socket 32 which is also of electrically non-conductive material and is secured within the lower or rear end of the metal barrel 2. To effect this, the lower extremity of the barrel may be provided with inturned lugs 33 (Figures 1, 3 and 6) which engage beneath segmental projections 34 on the socket 32, between which projections are gaps or spaces 36.

As seen in Figure 1 the tail piece may removably accommodate a contact member 39 which may also serve as a holder for a spare lamp bulb indicated at 38. This contact member may consist of a metal plate or disc provided with a contact in the form of an upstanding tongue 41 which is adapted to engage the inner surface of the torch barrel 2 and thus complete the circuit between the metal barrel and the bottom or rear end of the adjacent dry cell through the medium of a compression spring 42 which is secured to the disc 39. The edge of the latter may rest upon a ledge 43 inside the detachable member 29 of the tail piece and when the latter is in place the spring 42 presses forwardly so that the usual contact nipple on the front end of the cell within the head piece 16 is kept in engagement with the lamp bulb 7.

The said disc of the contact member 39 within the tail piece may also be provided with a spring clip 44 comprising a pair of spring lugs which may be cut or stamped from the disc so as to accommodate the spare lamp bulb 38 as seen in Figure 1.

According to a modified construction as seen in Figures 7 and 8, the hollow tail piece 29 may have secured across its open end, a contact plate 39 comprising a metal disc which is provided with downturned segmental flanges 47. These flanges grip the upper end of the tail piece 29 at intervals in its circumference and in the intervening intervals the tail piece is provided with segmental projections 48, the upper extremities form shoulders 49 which are disposed at a slightly lower level than the bottom edges of the downturned flanges 47. In fitting the tail piece to the barrel 2, according to this modified construction, the inturned lugs 33 on the lower end of the metal barrel are entered through the spaces between the downturned flanges 47 of the contact plate 39 and by slightly turning the barrel in relation to the tail piece, the inturned lugs 33 of the barrel are accommodated firmly between the lower edges of the downturned flanges 47 and the upper edges of the projections 48 on the tail piece which act as stops to limit its inward movement and detachably grip the lugs 33 against the lower edges of the flanges 47.

The metal contact plate or disc 39, as seen in Figures 7 and 8, is also provided with a central opening 51 to receive the compression spring 42 which forces the dry cells or batteries upwardly so as to maintain electrical contact with the lamp bulb 7. The opening 51 is slightly smaller than the spring 42 so as to grip and hold the latter in position.

In use, the torch is switched on and off by turning the head piece 16 in relation to the barrel 2 in such a manner that the segmental contact plate 14 within the head piece is engaged by the contact 13 on the bulb holder disc as aforesaid. The focusing operation may be then readily effected by merely pressing the head piece forwardly against the influence of the compression spring 18 therein which serves to return the head piece longitudinally of the barrel to its normal position.

As will be seen from Figure 13 the electrical circuit indicated by the full line "X" passes from the contact 13, through the bulb holder disc 3 and socket 6, through the lamp 7, and the dry cells or batteries, indicated at "X1" to the spring 42 in the tail piece. It then passes through

the contact member 39 and the metal barrel 2, through the spring 18 in the head piece and the contact plate 14 back to the contact on the bulb holder.

5 The invention provides a simple and inexpensive construction which functions effectively, is not liable to disorder and the elements of which may be readily assembled and taken apart.

10 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

15 1. An electric focusing torch wherein a head piece is mounted so as to have independent rotary and longitudinal sliding movement relative to the torch barrel said rotary movement opening or closing the
20 bulb circuit and said longitudinal movement effecting the focusing.

2. An electric torch according to claim 1, wherein a spring is interposed between said head piece or sleeve and said barrel
25 to control said relative longitudinal movement by which the focusing operation is effected.

3. An electric torch according to claim 2, wherein said spring is accommodated
30 within said head piece or sleeve between an internal shoulder thereon, and a flange or enlargement on the torch barrel, for the purpose specified.

4. An electric torch according to claim
35 1, wherein the making and breaking of the torch circuit is effected by engagement and disengagement of co-acting contacts carried by said barrel and said head piece or sleeve during relative rotary
40 movement thereof.

5. An electric torch according to claims
2, 3 or 4, wherein said contact of the head piece or sleeve consists of a segmental
45 contact plate mounted on the inner surface of the head piece which surrounds the upper or front end of the torch barrel and accommodates said spring which is compressed to effect focusing by longitudinal movement of the head piece on the
50 barrel whilst said segmental contact plate is engaged by the co-acting contact of the barrel.

6. An electric torch according to claim
55 5, wherein said segmental contact plate is accommodated within a recess on the inner surface of said head piece or sleeve, substantially as described.

7. An electric torch according to claim
60 6, wherein the side edges of said recess are of dovetailed formation, substantially as described.

8. An electric torch according to claim
65 5, wherein a metal bulb holder for the electric lamp is fitted within the upper or front end of the torch barrel and is pro-

vided with a contact which is adapted to engage said segmental contact plate within the head piece or sleeve.

9. An electric torch according to claim
70 8, wherein said contact of the bulb holder consists of a lug which projects sidewardly from a metal plate or disc having a screwed central socket to accommodate the lamp bulb, the outer end of said lug being adapted to engage the segmental
75 contact plate in the head piece or sleeve, substantially as described.

10. An electric torch according to claim
80 9, wherein said metal plate or disc of the bulb holder is accommodated between insulating discs or layers which are secured within the upper or front end of the torch barrel.

11. An electric torch according to claim
85 10, wherein the bulb holder and said insulating discs are secured within the upper or front end of the torch barrel by means of intumed tongues on the latter, substantially as described.

12. An electric torch according to claims
90 9 and 10, wherein said contact lug of the bulb holder projects through an opening in one of said insulating discs or the like, substantially as described.

13. An electric torch according to claims
95 1 or 2, wherein means are provided to limit the rotary movement of the head piece or sleeve in relation to the torch barrel when switching on and off the light.

14. An electric torch according to claim
100 13, wherein stops on the upper or front end of the torch barrel are accommodated by a recess in the inner surface of the head piece or sleeve, for the purpose specified.

15. An electric torch according to
105 claim 1, wherein a projection is provided on the exterior of the head piece or sleeve, and is adapted to be engaged by the thumb of the operator during the longitudinal
110 movement of the head piece to effect the focusing operation.

16. An electric torch according to claim
115 1, wherein the headpiece is constructed substantially as described and as illustrated in Figures 1, 2 and 9 of the accompanying drawings.

17. An electric torch according to claim
120 1, in combination with a hollow tail piece of insulating material which is adapted for detachable connection to the lower or rear end of the torch barrel, a metal contact plate fitted within or to the upper end of said tail piece and adapted to establish electrical contact with the metal torch
125 barrel and a compression spring fitted to said contact plate, for the purpose specified.

18. An electric torch according to claim
130 17, wherein said hollow tail piece is

adapted for detachable connection to a socket of insulating material which is secured within the lower or rear end of the metal torch barrel.

19. An electric torch according to claim 18, wherein said socket is constructed and secured within the lower or rear end of the torch barrel, substantially as described with reference to Figures 1, 3 and 6 of the accompanying drawings.

20. An electric torch according to claim 17, wherein said hollow tail piece and said metal contact plate are constructed and arranged substantially as described with reference to Figures 7 and 8 of the accompanying drawings.

21. An improved electric focusing torch characterised in that the electric circuit through the lamp and the dry cells or batteries within the torch barrel passes through the latter and through a contact plate in a head piece or sleeve which is

rotatably and slidably mounted upon the upper or front end portion of said barrel and is adapted by relative rotary movement of said head piece and barrel to engage and disengage a contact which is electrically connected with the lamp so that the light is switched on and off by such relative rotary movement, and when said contacts are thus engaged focusing may be effected by relative sliding movement of said head piece which carries the torch lens.

22. An improved electric torch constructed and adapted to operate, substantially as described and as illustrated in the accompanying drawings.

Dated this 18th day of August, 1941.

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[This Drawing is a reproduction of the Original on a reduced scale.]





